Use Attainability Analysis

for

WBID 0346 White Cloud Creek

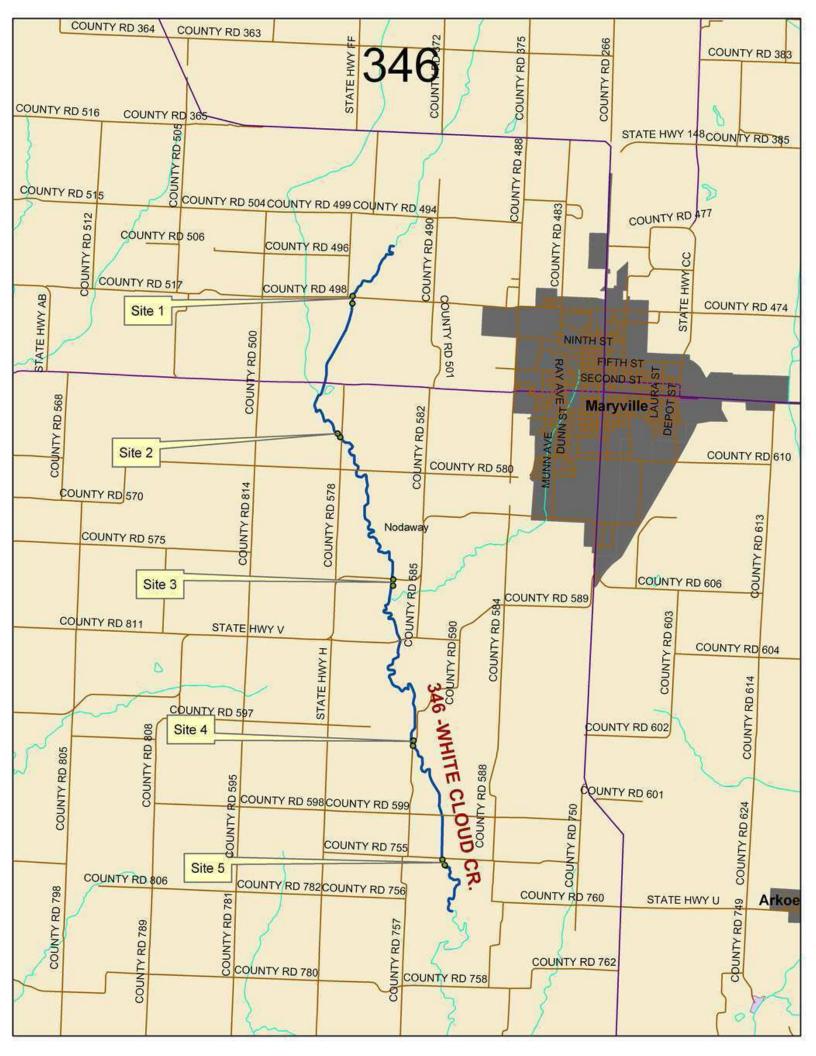
Submitted by SES Inc.

to Missouri Department of Natural Resources Water Protection Program

Date received: November 14, 2007

Data Sheet A - Water Body Identification

	Body Inforn		(For water bo				
Water Boo	dy Name (f	rom USGS 7.	5' quad):	Trib.	White Clo	oud Cr.	
Missouri V	Water Body	Identification	(WBID) Numb	er:	346		
8 digit HU	C code:	10240013			County:	Nodaway	
Upstream	Legal Des	cription (from	Table H):		T64N	R36W	Sec 11
Downstrea	am Legal D	escription (fro	om Table H):		T63N	R36W	Sec 24
Number o	f sites eval	uated:	5				
List all site	e numbers, 1, 2, 3, 4,		uently upstrea	m to dov	vnstream:		
Mark any	other items	that may be	•				sites clearly labeled.
Facility Na	ame(s) and	Permit Numb	per(s):				
	Highland	Estates Subo	I.				
	MO 0128	082					
		lease print le					
Name of S	Surveyor:	Gilisa Goul	d		Telephon	e Number:	913.307.0054
Organizat	ion/Employ	er:	SES, Inc				
complete			pleted all sec	tions, cl			e boxes, and that the form is
Signed:	gilisa go	uiu			Date:	10.04.07	



Data Sheet B-Site Characterization

Date & Time:	9.18.07	9:49		Site Location	on Descrip	tion (e.g. road	crossing):		
Personnel:	D. Dods	son & G. Gould		CR 517					
Current Weath	ner Cond	ditions: cloudy		Facility Name: Highland Estates Subd.					
Weather cond	itions fo	r the past 10 days: r	no precip.	Permit Nun	nber:	MO 0128082			
Drought conditions?: No drought ☑ ; Phase I □ ; Phase II □ ; Phase III □ ; Phase IV □ ; Unknown □									
Site Location	ı:								
Location Coor	dinates	(Universal Transver	se Mercator P	rojection, In	Meters				
Site 01	Easting	(UTM X):	Northing (UTI	M Y):		Horizontal Ac	ccuracy:	Meters	
		0336178		4469523			5	5.2	
Site 11	Easting	(UTM X):	Northing (UTI	M Y):		Horizontal Ac	ccuracy:	Meters	
Photos:			1	Ī			<u> </u>		
Photo ID#	F	Photo Purpose	Photo ID#:	Photo F	Purpose	Photo ID#:	Photo Purpos	e	
14		upstream	15	downstrear	n	16	street sign post (trash)		
		=				51 . 15"			
Photo ID#	F	Photo Purpose	Photo ID#	Photo Purpose		Photo ID#	Photo Purpos	e	
17		more trash	18	pipe					
Photo ID#		Photo Purpose	Photo ID#	Photo F	Purnose	Photo ID#	Photo Purpos		
1 Hoto ID#	'	noto i dipose	1 HOLO ID#	1 11010 1	игрозе	T HOLO ID#	1 Hoto 1 dipos	<u> </u>	
			1	1		1	l		
Uses Observ		<u> </u>	<u> </u>		I		<u> </u>		
☐ Swimming		☐ Skin diving	☐ SCUBA d	iving	☐ Tubin		☐ Water Skiing		
☐ Wind surfi	ng	☐ Kayaking	☐ Boating		☐ Wadir	ng	☐ Rafting		
☐ Hunting		☐ Trapping	☐ Fishing		✓ None	of the above	☐ Other:		
Describe:									

WBID#	346
Site #	1

	Data Sheet B-	Site Characterization (Cont	inuea)	
Surrounding Condition	ons:			
☐ City/County parks	☐ playgrounds	☐ MDC conservation lands	s □ Urban areas	☐ Rural Residential
☐ Campgrounds	☐ State parks	☐ National Forests	☐ Nature trails	☐ Stairs/walkways
☐ Boating accesses	☐ Fence	☐ No tresspass sign	☑ Steep Slopes	☐ Other:
Comments:			·	•
none				
	- <u>-</u>			
Evidence of Human l		T	<u> </u>	· .
□ Roads	☐ Foot path/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV/ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock watering
				Ī
comments/other:				
comments/other: trash				
trash	% Gravel	% Sand % Silt	% Mud/	Clay % Bedrock
trash Substrate:	% Gravel	% Sand % Silt 10	% Mud/ 90	
trash Substrate:	% Gravel			
trash Substrate:	% Gravel			
Substrate: % Cobble Aquatic Vegatation:				
Substrate: % Cobble Aquatic Vegatation:	% Gravel			
Substrate: % Cobble Aquatic Vegatation:				
Substrate: % Cobble Aquatic Vegatation:				
Substrate: % Cobble Aquatic Vegatation: 70% algae	e on substrate			
Substrate: % Cobble Aquatic Vegatation: 70% algae Water Characteristics	e on substrate s:	10	90	
Substrate: % Cobble Aquatic Vegatation: 70% algae Water Characteristic: Odor:	e on substrate s: □ Sewage	10 □ Musky □ Cher	90 mical	None ☐ Other:
Substrate: % Cobble Aquatic Vegatation: 70% algae Water Characteristics Odor: Color:	e on substrate s: □ Sewage ☑ Clear	10 ☐ Musky ☐ Cher ☐ Green ☐ Gray	mical	None ☐ Other: Milky ☐ Other:
Substrate: % Cobble Aquatic Vegatation: 70% algae Water Characteristic: Odor:	e on substrate s: □ Sewage	10 ☐ Musky ☐ Cher ☐ Green ☐ Gray	mical / sediments	None ☐ Other:

WBID#	346
Site #	1

Data Sheet B - Site Characterization (continued)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational use	Additional St	tream Morphology	(Record isolated pools of	or other features identified during	the survey that may sup	port recreational uses
---	---------------	------------------	---------------------------	-------------------------------------	-------------------------	------------------------

Channel Feature	Distance from	ed pools or other featu Width (m)	Length (m)	Median Depth (m)	
	access location (m)				
comments: (Please re	cord any additional comments	here.)			
(,				
	none				
Please verify that yo	u have completed all s	ections checke	d all applicable	hoxes, and that the	form is
	ou have completed all s	ections, checke	d all applicable	boxes, and that the	form is
Please verify that yo complete.	ou have completed all s	ections, checke	d all applicable	boxes, and that the	form is
	ou have completed all s	ections, checke	d all applicable	boxes, and that the	form is
omplete.					form is
omplete.	ou have completed all s gilisa gould				form is
omplete.					form is
omplete. urveyor's Signature:			_Date of Survey:		form is

Field Data Sheets for Recreational Use Stream Surveys Data Sheet C - Field Survey Results

																		Disso	lved Ox	xygen		
	Waterbo	ody ID:	346			Site #:	1		i							Date:	9.18.07			Time:	9:50	
	Estimate	ed Chanr	nel Incisi	on:	2.0	(m) (hei	ght betw	een low b	ank wid	th and wa	iter)					'		Oxygen:		13.6	(mg/L)	
								izontal Ac										•				
	01 11	UTM X UTM X	<u>:</u>	0336178	3		UTM Y: UTM Y:		446952	3		+/-	5.2	(meters)		Di	ssolved	Oxygen:			(% sat)	
		e Stream						(meters)		ength of		Segment:		150	(meters)		Specifi	ic Cond:			(μS/cm)	
		ermne Le						(20x avera	-				(*******)	Wa	ter Temp	oerature:		20	(°C)	
	Fiel	ld Staff:	Drew	Dodson		and	Gilisa G	ould						ī								
										Tra	nsect C	ross-Se	ction									
	0)1	0	2	0	3	()4	0)5	0	6		07	0	8	0	9	1	0	1	1
Station	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.5	0.05	0.2	0.05	0.4	0.05	0.4	0.05	0.3	0.05	0.5	0.05	0.6	0.05	0.4	0.05	0.3	0.05	0.5	0.05	0.4	0.00
2	0.9							0.05	0.5		0.9		1.1	0.05			0.5	0.05	0.9	0.10	0.7	0.05
3	1.4						1.1	0.05			1.4		1.7	0.05			0.8		1.4		1.1	
4	1.8		0.7	0.00			1.5		1.1		2.3		2.2	0.05	1.5		1.1	0.05	2.3	0.10	1.5	
6	2.8						2.2	0.05	1.4		2.8		3.3	0.05					2.8	0.00	2.2	0.13
7	3.2										3.2		3.9				1.9		3.2	0.00	2.6	
8	3.7	0.00	1.4	0.01	3.0	0.00	3.0	0.05	2.2	0.00	3.7	0.05	4.4	0.05	3.0	0.05	2.2	0.05	3.7	0.05	3.0	0.05
9	4.1	0.00	1.6	0.00	3.3	0.05	3.3	0.05	2.4	0.00	4.1	0.05	5.0	0.05	3.3	0.05	2.4	0.05	4.1	0.00	3.3	0.05
light Bank	4.6	0.00	1.8	0.00	3.7	0.00	3.7	0.00	2.7	0.00	4.6	0.00	5.5	0.05	3.7	0.00	2.7	0.00	4.6	0.00	3.7	0.00
eature Type	ı rı	un	rı	ın	rı	ın	r	un	rı	ın	rı	ın	r	un	ru	ın	rı	ın	ru	ın	ru	ın

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: gilisa gould Date: 10.04.07	gned: gilisa gould Da	ate:	10.04.07	
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WBID#	346
Site #	2

Data Sheet B-Site Characterization

Date & Time:	9.18.07	7 10:30		Site Location	on Descrip	tion (e.g. road	crossing):		
Personnel:	D. Dod	son & G. Gould		CR 578					
Current Weatl	ner Cond	ditions: cloudy		Facility Nar	Facility Name: Highland Estates Subd.				
Weather cond	itions fo	r the past 10 days:	no precip.	Permit Nun	nber:	MO 0128082			
Drought condi	tions?: I	No drought ☑ ; Pha	se I □ ; Phase	· II □ ; Phas	e <mark>III □ ; Pl</mark>	nase IV □ ; Ur	nknown 🗆		
Site Location	1:								
		(Universal Transver	se Mercator Pr	rojection, In	Meters				
Site 01	Easting	ı (UTM X):	Northing (UTN	И Y):		Horizontal Ac	curacy: Me	ters	
		0335949		4466991			6.4		
Site 11	Easting	ı (UTM X):	Northing (UTN	<u>—</u> И Y):		Horizontal Ac	curacy: Me	ters	
		0335902		4467064			5.2		
		0000002		4-07001			V. <u>L</u>		
Photos:	T		-			1	·		
Photo ID#	F	Photo Purpose	Photo ID#:	Photo F	Purpose	Photo ID#:	Photo Purpose		
20		upstream	21	downstrear	n	22	livestock watering		
Photo ID#	P	Photo Purpose	Photo ID#	Photo F	Purpose	Photo ID#	Photo Purpose		
Photo ID#	P	Photo Purpose	Photo ID#	Photo F	Purpose	Photo ID#	Photo Purpose		
Uses Observ	ed:								
☐ Swimming	J	☐ Skin diving	□ SCUBA di	iving	☐ Tubin	g	☐ Water Skiing		
☐ Wind surfi	ng	☐ Kayaking	☐ Boating		□ Wadir	ng	□ Rafting		
☐ Hunting		☐ Trapping	☐ Fishing		☑ None	of the above	☐ Other:		
Describe:		,, ,	<u> </u>						

WBID#	346
Site #	2

Data Sheet B- Site Characterization (Continued)

		-			
tions:					
☐ playgrounds	☐ MDC conse	rvation lands	☐ Urban areas	☐ Rural F	Residential
☐ State parks	☐ National For	rests	☐ Nature trails	☐ Stairs/\	walkways
☐ Fence	☐ No tresspas	s sign	☑ Steep Slopes	☐ Other:	•
	•				
Haar					
	□ Dook/platfor	<u></u> T	Comping Sites	T Done (····ingo
☐ Fire piviling	I I INLDEO DISO	narge <u>I</u>	LI FISHING TACKIC	LIVE310	OK Watering
% Gravel		% Silt			% Bedrock
	10		90)	
cs:					
☐ Sewage	☐ Musky	☐ Chemi	ical 🗹	None	☐ Other:
☐ Clear	☑Green				☑ Other:
				·· •	brown
☐ Sludge	☐ Solids				☐ Other:
□ Oil	☐ Scum	☐ Foam	<u> </u>	Vone	☐ Other:
	Use: Foot path/prints Fire pit/ring	Use: □ Foot path/prints □ Dock/platform □ Fire pit/ring □ NPDES Disc % Gravel % Sand 10 cs: □ Sewage □ Musky □ Clear ☑ Green □ Sludge □ Solids	□ playgrounds □ MDC conservation lands □ State parks □ National Forests □ Fence □ No tresspass sign Use: □ Foot path/prints □ Dock/platform □ Fire pit/ring □ NPDES Discharge % Gravel % Sand % Silt 10 Cs: □ Sewage □ Musky □ Chemi □ Clear □ Gray □ Sludge □ Solids □ Fine se	□ playgrounds □ MDC conservation lands □ Urban areas □ State parks □ National Forests □ Nature trails □ Fence □ No tresspass sign ☑ Steep Slopes Wase:	□ playgrounds

WBID#	346
Site #	2

Data Sheet B - Site Characterization (continued)

Additional Stream Morphology: (Record isolated pools or other features identified during the	ne survey that may support recreational uses)
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Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)
	·				
omments: (Please re	cord any additional comments l	here.)			
,	•	,			
	none				
lease verify that yo omplete.	ou have completed all s	ections, checke	d all applicable	boxes, and that the	form is
omplete.					form is
omplete.	ou have completed all s gilisa gould		d all applicable Date of Survey:		form is

Field Data Sheets for Recreational Use Stream Surveys Data Sheet C - Field Survey Results

																		Disso	lved Ox	ygen		
	Waterbo	ody ID:	346			Site #:	2									Date:	9.18.07			Time:	10:34	
	Estimate	ed Chann	nel Incisio	on:	1.0	(m) (hei	ght betw	een low b	ank wid	th and wa	ater)					Di	ssolved (Oxygen:		15.1	(mg/L)	
	GPS Lo	cation - I	Easting (UTM X)	, Northin	g (UTM	Y), Hor	izontal Ac	curacy I	Estimate	(EPE / P	DOP / FO	OM)					,			, , ,	
		UTM X		0335949		1			446699		•	+/-	6.4	(meters)		Di	ssolved (Oxygen:			(% sat)	
	11	UTM X	<u> </u>	0335902	2	1	UTM Y:		4467064	4	•	+/-	5.2	(meters)			G	. C 1.			(C/)	
	Average	Stream	Width:				2.9	(meters)	L	ength of	Survey S	Segment:		150	(meters)		Specifi	e Cond:			(μS/cm)	
			ngth of F					(=======)		20x avera		-			(======)	Wa	ter Temp	erature:		20.5	(°C)	
	Fiel	d Staff:	Drew	Dodson	and	Gilisa G	ould							-								
										Tra	nsect C	ross-Se	ction									
	0	1	0	2	0	3		04	()5	0	16		07	08	1	0	g	10	0	11	1
~ .	Distance		Distance		Distance		Distance		Distance		Distance		Distance				Distance		Distance	-	Distance	
Station	(m)	Depth (m)	(m)	Depth (m)	(m)	Depth (m)		Depth (m)	(m)	Depth (m)	(m)	Depth (m)			Distance (m)		(m)	Depth (m)	(m)	Depth (m)	(m)	Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.4	0.05	0.4	0.05	0.4	0.05	0.4	0.05	0.2	0.10	0.3	0.05	0.3	0.05	0.3	0.05	0.2	0.05	0.3	0.05	0.3	0.10
2	0.7	0.15	0.7	0.10	0.7	0.10	0.7	0.10	0.4	0.15	0.5	0.10	0.5	0.20	0.5	0.15	0.4	0.10	0.5	0.10	0.5	0.15
3	1.1	0.15	1.1	0.05	1.1	0.20	1.1	0.20	0.5	0.20	0.8	0.25	0.8	0.25	0.8	0.20	0.5	0.20	0.8	0.15	0.8	0.35
4	1.5	0.20			1.5	0.25	1.5	0.25	0.7						1.1	0.15	0.7	0.25	1.1		1.1	0.45
4																						
5	1.9	0.20	1.9	0.15	1.9	0.30	1.9	0.15	0.9	0.05	1.4	0.40	1.4	0.30	1.4	0.20	0.9	0.15	1.4	0.30	1.4	0.60
6	2.2	0.20	2.2	0.25	2.2	0.30	2.2	0.10	1.1	0.00	1.6	0.30	1.6	0.20	1.6	0.20	1.1	0.30	1.6	0.30	1.6	0.45
7	2.6	0.30	2.6	0.20	2.6	0.25	2.6	0.10	1.3	0.05	1.9	0.20	1.9	0.10	1.9	0.15	1.3	0.25	1.9	0.20	1.9	0.30
8	3.0	0.20	3.0	0.20	3.0	0.10	3.0	0.10	1.4	0.05	2.2	0.10	2.2	0.05	2.2	0.10	1.4	0.25	2.2	0.15	2.2	0.30
9	3.3	0.10	3.3	0.05	3.3	0.05	3.3	0.05	1.6	0.00	2.4	0.05	2.4	0.05	2.4	0.10	1.6	0.15	2.4	0.05	2.4	0.25
Right Bank	3.7	0.00	3.7	0.00	3.7	0.00	3.7	0.00	1.8	0.00	2.7	0.00	2.7	0.00	2.7	0.00	1.8	0.00	2.7	0.00	2.7	0.00
Feature Type																						
riffle, run, or pool	ru	ın	ru	ın	ru	ın	r	un	rı	un	rı	ın	r	un	rui	1	ru	n	ru	n	ru	n

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: gilisa gould Date: 10.04.07	
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WBID#	346
Site #	3

Data Sheet B-Site Characterization

				_				
Date & Time:	11:03		Site Location	Site Location Description (e.g. road crossing):				
Personnel:	D. Dods	son & G. Gould			Highway \	V		
Current Weatl	ner Cond	ditions: cloudy		Facility Nar	me:	Highland Esta	ates Subd.	
Weather cond	litions fo	r the past 10 days: r	no precip.	Permit Nun	nber:	MO 0128082		
Drought condi	itions?: N	No drought ☑ ; Pha	se I □ ; Phase	Ⅱ 🛛 ; Phas	e III □ ; PI	hase IV □ ; Ur	nknown 🗆	
		-						
Site Location								
		(Universal Transver	se Mercator Pi	rojection, In	Meters			
Site 01	Easting	(UTM X):	Northing (UTN	М Y):		Horizontal Ac	curacy:	Meters
		1336950		4464304				4.0
Site 11	Easting	(UTM X):	Northing (UTN	M Y):		Horizontal Ac	curacy:	Meters
	Ĭ	0336946	,	4464186			,	4.9
0336946 4464186 4.9								
Photos:			_	_				
Photo ID#	F	Photo Purpose	Photo ID#:	to ID#: Photo Pur		Photo ID#:	Photo Purp	oose
23		upstream	24	downstrear	m			
Photo ID#	P	Photo Purpose	Photo ID#	Photo Purpose		Photo ID#	Photo Purp	ose
Photo ID#	P	hoto Purpose	Photo ID#	Photo F	Purpose	Photo ID#	Photo Purpose	
Uses Observ	ed:							
-		☐ Skin diving	☐ SCUBA di	iving	☐ Tubing		☐ Water Skiing	
☐ Wind surfi	ng	☐ Kayaking	☐ Boating	-	☐ Wading		□ Rafting	
☐ Hunting		☐ Trapping	☐ Fishing		✓ None of the above		☐ Other:	
Describe:								

WBID#	346
Site #	3

Data Sheet B- Site Characterization (Continued)

Surrounding Conditi					•
☐ City/County parks	☐ playgrounds	☐ MDC conservation		Urban areas	☐ Rural Residential
□ Campgrounds	☐ State parks	☐ National Forest		Nature trails	☐ Stairs/walkways
☐ Boating accesses	☐ Fence	☐ No tresspass s	ign ☑ S	Steep Slopes	☐ Other:
Comments:					
none					
Evidence of Human	Hoo				
□ Roads		☐ Dock/platform	Ind	Compine Citos	I □ Dono outingo
☐ R0ads ☐ RV/ATV Tracks	☐ Foot path/prints ☐ Fire pit/ring	☐ NPDES Dischar		Camping Sites Fishing Tackle	☐ Rope swings ☐ Livestock watering
comments/other:	□ Fire pit/fing	I INPUES DISCHAR	ge j⊔r	isning rackie	Livestock watering
none					
none					
Substrate:					
% Cobble	% Gravel	% Sand	% Silt	% Mud/0	Clay % Bedrock
				100	•
Aquatic Vegatation:					
none					
Water Characteristic					
Odor:	☐ Sewage	□ Musky	☐ Chemical		None
Color:	□ Clear	☑Green	□ Gray		Milky
Bottom Deposit:	□ Sludge	□ Solids	☐ Fine sedin		None
Surface Deposit:	□ Oil	☐ Scum	□ Foam	⊌N	lone ☐ Other:

WBID#	346
Site #	3

Data Sheet B - Site Characterization (continued)

	Additional Stream Morn	phology:	(Record isolated pools or other features identified during the survey that may support recreational	uses)
--	------------------------	----------	---	-------

Channel Feature	Distance from	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)
	access location (m)				
comments: (Please re	ecord any additional comments h	nere.)			
	none				
	Horie				
Please verify that your complete.	ou have completed all so	ections, checke	d all applicable	boxes, and that the f	form is
Gurveyor's Signature:	gilisa gould		Date of Survey:	09.18.07	
			_		

Field Data Sheets for Recreational Use Stream Surveys Data Sheet C - Field Survey Results

																		Disso	lved Ox	xygen		
					="											Date:	9.18.07			Time:	11:05	
		ed Chanr				• ` ` ` `		een low b								Di	issolved	Oxygen:		13.6	(mg/L)	
	01	cation - I UTM X UTM X	:	0336950 0336946)			izontal Ac	-			DOP / FO +/- +/-	OM) 4 4.9	(meters)		Di	issolved	Oxygen:			(% sat)	
		e Stream			0	-		(meters)			•			(meters)	(matara)		Specif	ic Cond:			(µS/cm)	
		ermne Le					3.1	(illeters)	1	ength of 20x avera				130	(meters)	Wa	iter Temj	perature:		20.9	(°C)	
	Fiel	ld Staff:	Drew	Dodson		and	Gilisa G	ould						<u>-</u>								
										Tra	nsect C	ross-Se	ction									
	0)1	0)2	0)3		04	0)5	0)6		07	0	8	0	9	1	0	1	1
Station	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)
eft Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.5	0.10	0.6	0.05	0.6	0.05	0.6	0.25	0.7	0.10	0.6	0.30	0.5	0.10	0.6	0.20	0.6	0.05	0.6	0.25	0.6	0.05
2	0.9	0.20	1.1	0.25	1.1	0.25	1.3	0.40	1.5	0.40	1.1	0.50	0.9	0.20	1.1	0.55	1.3	0.35	1.1	0.50	1.1	0.35
3	1.4	0.35	1.7	0.45	1.7	0.55	1.9	0.40	2.2	0.65	1.7	0.70	1.4	0.50	1.7	0.70	1.9	0.70	1.7	0.65	1.7	0.55
4	1.8	0.45	2.2	0.55	2.2	0.45	2.6	0.50	2.9	0.70	2.2	0.70	1.8	0.60	2.2	0.70	2.6	0.70	2.2	0.65	2.2	0.70
5	2.3	0.50	2.8	0.60	2.8	0.50	3.2	0.50	3.7	0.90	2.8	0.85	2.3	0.65	2.8	0.70	3.2	0.70	2.8	0.75	2.8	0.70
6	2.8	0.55	3.3		3.3									0.65	3.3			0.70	3.3		3.3	0.75
7	3.2		3.9		3.9						3.9		3.2	0.55	3.9			0.60	3.9		3.9	0.70
8	3.7 4.1	0.40	4.4 5.0		4.4 5.0			0.40			5.0	0.60	3.7 4.1	0.50	5.0			0.50	5.0		5.0	0.60
ight Bank	4.1	0.30	5.5	0.00	5.5	0.20	6.4	0.20	7.3	0.43	5.5	0.00	4.6	0.30	5.5	0.23	6.4	0.00	5.5	0.13	5.5	0.00
eature Type				110				1110		100		110										
ffle, run, or pool	rı	ın	rı	ın	rı	un	r	un	rı	ın	rı	ın	r	un	ru	111	rı	ın	n	111	ru	111

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: gilisa gould Date: 10.04.07	
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WBID#	346
Site #	4

Data Sheet B-Site Characterization

Date & Time:	9.18.07	7 12:16	j	Site Location	on Descrip	tion (e.g. road	crossing):			
Personnel:	D. Dods	son & G. Gould		CR 757						
Current Weat	her Cond	ditions: cloudy		Facility Nar	me:	Highland Esta	ates Subd.			
Weather cond	litions fo	r the past 10 days: ı	no precip.	Permit Nun	nber:	MO 0128082				
Drought cond	itions?: N	No drought ☑ ; Pha	se I □ ; Phase	: II □ ; Phas	e III □ ; PI	nase IV □ ; Ur	nknown 🗆			
Site Location										
		(Universal Transver	rse Mercator Pi	rojection, In	Meters					
Site 01	Easting	g (UTM X):	Northing (UTN	M Y):		Horizontal Ac	curacy:	Meters		
		0337323		4461157				7.0		
Site 11	Easting	ı (UTM X):	Northing (UTN	M Y):		Horizontal Ac	curacy:	Meters		
		0337334		4461258			,	7.3		
7.0										
Photos:										
Photo ID#	F	Photo Purpose	Photo ID#:	Photo F	Purpose	Photo ID#:	Photo Purp	ose		
25		downstream	26	upstream		27	trash			
Photo ID#	Р	Photo Purpose	Photo ID#	Photo F	Purpose	Photo ID#	Photo Purp	ose		
Photo ID#	Р	Photo Purpose	Photo ID#	Photo F	Purpose	Photo ID#	Photo Purp	ose		
				,						
Uses Observ	ed:									
☐ Swimming		☐ Skin diving	□ SCUBA di	ivina	☐ Tubin	n	☐ Water Skiing			
☐ Wind surfi		☐ Kayaking	☐ Boating	<u>g</u>	□ Wadir		☐ Rafting			
	9		☐ Fishing			of the above	☐ Other:			
☐ Hunting Describe:		☐ Trapping			M None	or the above	□ Otner.			

WBID#	346
Site #	4

Data Sheet B- Site Characterization (Continued)

Surrounding Conditi	ons:			
☐ City/County parks	☐ playgrounds	☐ MDC conservation lands	s □ Urban areas	☐ Rural Residential
☐ Campgrounds	☐ State parks	□ National Forests	□ Nature trails	☐ Stairs/walkways
☐ Boating accesses	☐ Fence	☐ No tresspass sign		☐ Other:
Comments:				
none				
Full-man of Human i				
Evidence of Human			1	I
☐ Roads	☐ Foot path/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
□ RV/ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock watering
comments/other:				
lots of tras	.h			
13.11.23.34.11.44.	ill.			
10.0 01 1140				
loto or unc	~ ··			
10.0 01 11.00				
Substrate:				
	% Gravel	% Sand % Silt	% Mud/0	Clav % Bedrock
Substrate:		% Sand % Silt 30 10	% Mud/0 60	-
Substrate:				•
Substrate:				•
Substrate: % Cobble				•
Substrate: % Cobble				•
Substrate: % Cobble Aquatic Vegatation:				•
Substrate: % Cobble Aquatic Vegatation:				•
Substrate: % Cobble Aquatic Vegatation: none	% Gravel			•
Substrate: % Cobble Aquatic Vegatation:	% Gravel	30 10	60	
Substrate: % Cobble Aquatic Vegatation: none Water Characteristic Odor:	% Gravel	30 10	mical ☑ I	vone □ Other:
Substrate: % Cobble Aquatic Vegatation: none Water Characteristic Odor: Color:	% Gravel *s: Sewage Clear	30 10 ☐ Musky ☐ Che ☐ Green ☐ Gray	mical ☑ I	None □ Other: Milky □ Other:
Substrate: % Cobble Aquatic Vegatation: none Water Characteristic Odor:	% Gravel	30 10 ☐ Musky ☐ Che ☐ Green ☐ Gray	mical ☑ I / □ I sediments ☑ I	Vone ☐ Other:

WBID # 346 Site # 4

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B - Site Characterization (continued)

Additional Stream M	lorphology: (Record isolate	ed pools or other featu	res identified during	the survey that may support	ort recreational uses)
Channel Feature	Distance from	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Channel Feature	access location (m)	vviditi (III)	Lengui (III)	Median Depth (III)	Max Depth (III)
	access location (III)				
			•		
Comments: (Please re	cord any additional comments	here.)			
	none				
	TIOTIC				
Please verify that yo complete.	ou have completed all s	ections, checke	d all applicable	boxes, and that the	form is
Surveyor's Signature:	gilisa gould		Date of Survey:	9.18.07	
Organization:	SES, Inc		Position:	field team leader	
Organization.	<u> </u>		- 1 03111011.	noid tourn loadel	

Field Data Sheets for Recreational Use Stream Surveys Data Sheet C - Field Survey Results

																		Disso	lved Ox	ygen		
	Waterbo	ody ID:	346			Site #:	4		•							Date:	9.18.07			Time:	12:16	
	Estimate	ed Chanr	nel Incisi	on:	0.0	(m) (hei	ght betw	een low b	ank wid	th and wa	iter)						issolved ()vvaen:		11.1	(mg/L)	
	GPS Lo	cation - 1	Easting (UTM X)	, Northin	ng (UTM	Y), Hori	izontal Ac	curacy I	Estimate	(EPE / P	DOP / FO	OM)					•			(IIIg/L)	
		UTM X UTM X		0337323			UTM Y: UTM Y:		446115			+/-	7.3	(meters)	•	Di	ssolved (Oxygen:			(% sat)	
											•						Specifi	c Cond:			(µS/cm)	
		e Stream ermne Le				6.2		(meters)		ength of 20x avera	-	-		150	(meters)	Wa	ter Temp	erature:		21.7	(°C)	
	Fiel	ld Staff:	Drew	Dodson		and	Gilisa G	ould														
		id Starr.	Biew	Dousen		una	GIIISU G	oura		T	4.0	G	4.									_
							l			Tra	nsect C	ross-Se	ction									
	Distance) <u>1</u>	0 Distance	2	0 Distance	3	Distance)4	Distance)5 	Distance	6	Distance	07 T	08	8	Distance	9	1 Distance	D	1 Distance	1
Station	(m)	Depth (m)	(m)	Depth (m)	(m)	Depth (m)		Depth (m)	(m)	Depth (m)	(m)	Depth (m)	(m)	Depth (m)	Distance (m)	Depth (m)	(m)	Depth (m)	(m)	Depth (m)		Depth (m)
eft Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.5	0.05	1.0	0.05	0.7	0.10	0.7	0.05	0.6	0.10	0.6	0.10	0.6	0.15	0.6	0.10	0.6	0.10	0.5	0.10	0.5	0.10
2	0.9	0.15	2.0	0.20	1.5	0.50	1.5	0.35	1.3	0.30	1.3	0.20	1.1	0.55	1.1	0.40	1.1	0.30	0.9	0.45	0.9	0.30
3	1.4	0.25	3.0	0.30	2.2	0.60	2.2	0.55	1.9	0.40	1.9	0.40	1.7	0.65	1.7	0.60	1.7	0.40	1.4	0.65	1.4	0.40
4	1.8	0.40	4.0	0.40	2.9	0.65	2.9	0.55	2.6	0.40	2.6	0.30	2.2	0.55	2.2	0.70	2.2	0.45	1.8	0.65	1.8	0.40
5	2.3	0.65	5.1	0.35	3.7	0.75	3.7	0.55	3.2	0.50	3.2	0.40	2.8	0.50	2.8	0.70	2.8	0.60	2.3	0.70	2.3	0.55
6	2.8	0.60	6.1	0.35	4.4	0.80	4.4	0.55	3.8	0.50	3.8	0.30	3.3	0.45	3.3	0.60		0.45	2.8	0.65	2.8	0.55
7	3.2		7.1	0.50				0.50							3.9			0.40	3.2	0.55		0.50
8	3.7	0.40	8.1	0.50	5.8	0.30	5.8	0.25	5.1		5.1	0.20	4.4	0.20	4.4	0.45	4.4	0.30	3.7	0.55	3.7	0.40
9	4.1	0.35	9.1	0.30	6.6			0.10							5.0		5.0	0.20	4.1	0.55	4.1	0.15
ight Bank	4.6	0.00	10.1	0.00	7.3	0.00	7.3	0.00	6.4	0.00	6.4	0.00	5.5	0.00	5.5	0.00	5.5	0.00	4.6	0.00	4.6	0.00
eature Type ffle, run, or pool	rı	un	rı	ın	rı	ın	m	ıın	rı	ın	rı	ın	r	un	ru	n	ru	n	ru	ın	ru	n
111c, 1uii, 01 p001		411	10	***	10	***	1	run run ri			411		W11	Tu	11	1 1		1 4		14	11	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: gilisa gould Date: 10.04.07	
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WBID#	346
Site #	5

Data Sheet B-Site Characterization

Date & Time:	9.18.07	13:07		Site Location Description (e.g. road crossing):						
Personnel:	D. Dods	son & G. Gould		downstream from site 171						
Current Weatl	ner Cond	ditions: cloudy		Facility Nar	me:	Highland Esta	ates Subd.			
Weather cond	r the past 10 days: ı	no precip.	Permit Nun	nber:	MO 0128082					
Drought cond	No drought ☑ ; Pha	se I □ ; Phase	II □ ; Phas	e III □ ; Pl	hase IV □ ; Ur	nknown 🗆				
		-								
Site Location										
		(Universal Transver	se Mercator Pi	rojection, In	Meters					
Site 01	Easting	(UTM X):	Northing (UTN	М Y):		Horizontal Ac	curacy: Mete			
		0337880		4459005			5.2			
Site 11	Easting	(UTM X):	Northing (UTN	И Y):		Horizontal Ac	curacy:	Meters		
		,	, , , , , , , , , , , , , , , , , , ,	•			-			
0337925 4458903 6.4										
Photos:										
Photo ID#	F	Photo Purpose	Photo ID#:	Photo F	Purpose	Photo ID#:	Photo Purpose			
28		upstream	29	downstrear	m					
		·								
Photo ID#	Р	Photo Purpose	Photo ID#	Photo F	Purpose	Photo ID#	Photo Purpose			
Photo ID#	Р	hoto Purpose	Photo ID#	Photo F	Purpose	Photo ID#	Photo Purpose			
Uses Observ	ed:									
☐ Swimming	1	☐ Skin diving	☐ SCUBA di	iving	☐ Tubin	q	☐ Water Skiing			
☐ Wind surfi	ng	☐ Kayaking	☐ Boating		□ Wadir	ng	☐ Rafting			
☐ Hunting		☐ Trapping	☐ Fishing		✓ None of the		☐ Other:			
Describe:		п паррінд	L Tioning		E None	or the above	Li Other.			

WBID#	346
Site #	5

Data Sheet B- Site Characterization (Continued)

Surrounding Conditi	ons:			
☐ City/County parks	☐ playgrounds	☐ MDC conservation lands	s □ Urban areas	☐ Rural Residential
☐ Campgrounds	☐ State parks	□ National Forests	☐ Nature trails	☐ Stairs/walkways
☐ Boating accesses	☑ Fence	☐ No tresspass sign	☑ Steep Slopes	☐ Other:
Comments:				
none				
Evidence of Human	Use:			
□ Roads	☐ Foot path/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV/ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock watering
comments/other:				
none				Ī
Hone				
Hone				
Hono				
Substrate:				
	% Gravel	% Sand % Silt	% Mud/	Clay % Bedrock
Substrate:	% Gravel	% Sand % Silt	% Mud/0 10	-
Substrate: % Cobble	% Gravel			-
Substrate:	% Gravel			-
Substrate: % Cobble Aquatic Vegatation:	% Gravel			-
Substrate: % Cobble	% Gravel			-
Substrate: % Cobble Aquatic Vegatation:	% Gravel			-
Substrate: % Cobble Aquatic Vegatation:	% Gravel			-
Substrate: % Cobble Aquatic Vegatation:				•
Substrate: % Cobble Aquatic Vegatation: none	·s: □ Sewage	90	10 mical ☑ I	•
Substrate: % Cobble Aquatic Vegatation: none Water Characteristic Odor: Color:	s: □ Sewage □ Clear	90 Musky □ Che Green □ Gray	mical ☑ I	None □ Other: Milky □ Other:
Substrate: % Cobble Aquatic Vegatation: none Water Characteristic Odor:	·s: □ Sewage	90 Musky □ Che Green □ Gray	mical ☑ I	None ☐ Other:

WBID # 346 Site # 5

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B - Site Characterization (continued)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)
	decess recation (m)				
				L	
Comments: (Please re	cord any additional comments h	nere.)			1
none					
Please verify that yo complete.	ou have completed all se	ections, checke	ed all applicable	boxes, and that the f	orm is
Surveyor's Signature:	gilisa gould		_Date of Survey:	9.18.07	
Organization:	SES, Inc		Position:	field team leader	

Field Data Sheets for Recreational Use Stream Surveys Data Sheet C - Field Survey Results

																		Disso	lved Ox	ygen		
	Waterbo	ody ID:	346			Site #:	5									Date:	9.18.07			Time:	13:07	
	Estimat	ed Chanr	nel Incisi	on:	2.7	(m) (hei	ght betw	een low b	ank widt	th and wa	nter)					Di	issolved (Oxvgen:		10.07	(mg/L)	
				UTM X)	, Northin	-		izontal Ac	curacy I	Estimate ((EPE / P	DOP / FO	OM)					,			(0)	
	01 UTM X: 0337880 UTM Y: 4459005 +/- 5.2 (meters) 11 UTM X: 0337925 UTM Y: 4458903 +/- 6.4 (meters)										Dissolved Oxygen:(% sat)											
	11	UIMA		0337923	,		UIMI.		443690.)	•	+/-	0.4	(meters)	•		Specifi	c Cond:			(µS/cm)	
							6.2	(meters)		ength of	-	-		150	(meters)			•				
	(To dete	ermne Le	ength of I	Reach)					(2	20x avera	ge strear	n width)				Wa	ter Temp	erature:		22.7	(°C)	
	Field Staff: Gilisa Gould and Drew Dodson																					
		Transect Cross-Section																				
	(01 02 03 04						O	05 06 07			08	3	09		10		11				
Station	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m
eft Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.7	0.10	0.8	0.05	0.6	0.05	0.6	0.10	0.6	0.05	0.7	0.40	0.6	0.60	0.4	0.05	0.6	0.05	0.6	0.05	0.6	0.10
2	1.5	0.35	1.6	0.15	1.3	0.30	1.3	0.25	1.1	0.25	1.5	0.40	1.1	0.65	0.7	0.15	1.1	0.25	1.3	0.15	1.3	0.20
•	2.2				1.9			0.35						0.70	1.1			0.30	1.9	0.30	1.9	0.35
4	2.9							0.30						0.70	1.5			0.50	2.6	0.50		0.20
4	3.7	0.00	4.1	0.20	3.2	0.30	3.2	0.35	2.8	0.35	3.7	0.50	2.8	0.50	1.9	0.15	2.8	0.35	3.2	0.60	3.2	0.25
	4.4	0.00	4.9	0.20	3.8			0.30	3.3	0.30	4.4	0.40	3.3	0.30	2.2	0.25	3.3	0.50	3.8	0.50	3.8	0.30
7	5.1	0.05	5.7	0.25	4.5	0.15	4.5	0.30	3.9	0.30	5.1	0.30	3.9	0.20	2.6	0.30	3.9	0.50	4.5	0.50	4.5	0.30
8	5.8	0.10	6.6	0.25	5.1	0.15	5.1	0.20	4.4	0.25	5.8	0.25	4.4	0.35	3.0	0.20	4.4	0.25	5.1	0.04	5.1	0.30
9	6.6	0.20	7.4	0.25	5.8	0.10	5.8	0.05	5.0	0.20	6.6	0.15	5.0	0.35	3.3	0.10	5.0	0.15	5.8	0.20	5.8	0.10
ight Bank	7.3	0.00	8.2	0.00	6.4	0.00	6.4	0.00	5.5	0.00	7.3	0.00	5.5	0.00	3.7	0.00	5.5	0.00	6.4	0.00	6.4	0.00
eature Type																						
ffle, run, or poo	n, or pool riffle		run		run run		r	un	n	ın	rı	run run			riff	ffle run		pool run				

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: gilisa gould Date: 10.04.07	
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Site# 1 Photo ID# 14, Upstream



Site# 1 Photo ID# 16, Street sign post (trash)



Site# 1 Photo ID# 15, Downstream



Site# 1 Photo ID# 17, More trash



Site# 1 Photo ID# 18, Pipe



Site# 2 Photo ID# 21, Downstream



Site# 2 Photo ID# 20, Upstream



Site# 2 Photo ID# 22, Livestock watering



Site# 3 Photo ID# 23, Upstream



Site# 4 Photo ID# 25, Downstream



Site# 3 Photo ID# 24, Downstream



Site# 4 Photo ID# 26, Upstream



Site# 4 Photo ID# 27, Trash



Site# 5 Photo ID# 29, Downstream



Site# 5 Photo ID# 28, Upstream